



Option Manual

Mechanical PCB Stopper ACM

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CHAPTER 1 Introduction

1.1 Product description

The ACM PCB transport is standard equipped with an optical sensor system for detection of the PCB. Based on this detection the PCB will be stopped in a well defined position in the work area. For most PCB's this system works fine. But some PCB materials are not seen accurate enough by the optical sensors resulting in stopping of the boards in the wrong position (outside the search area for the board fiducials). As a result the ACM will go into error status and manual intervention is required. In these cases the mechanical PCB stopper can be used. The mechanical PCB stopper is a project based solution.

Below pictures are shown of the stopper in up and in down position:

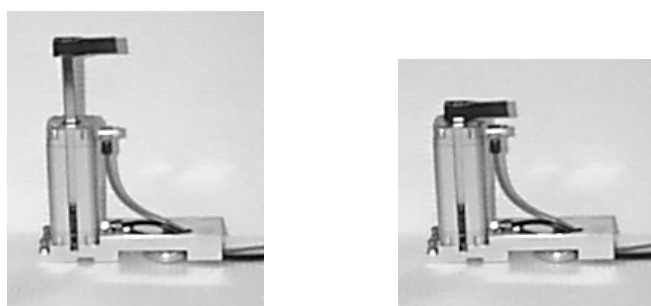


FIGURE 1

1.2 Restrictions to the specification of the standard ACM

Usage of the mechanical stopper imposes some restrictions on the specification of a standard ACM (with optical stopper). The table below lists the difference with the rel 2.0 specification.

ITEM	Specification rel. 2.0	With mechanical stopper
Minimal PCB width	50 mm	66 mm
Maximal PCB length	508 mm	445 mm
Maximal height pre-mounted components bottom side	45 mm	40 mm
Extra cycle time	0 sec	less than 2.5 sec

TABLE 1



NOTE: The mechanical stopper still makes use of the optical sensors. The slow sensor must detect a board in between 35 mm before (e.g. a connector) and 25 mm after the physical edge on which the board is mechanically stopped.

CHAPTER 2 First time installation

2.1 General

The majority to the installation is done in and or to the Electrical Unit Left. This unit is located at the upper left corner of the hoist plate (see also Chapter 6 of the ACM service manual).

The easiest access to the Electrical Unit Left is via the rear side of the machine. **In the rest of the document when referring to this unit it is supposed that the unit is seen via the rear side of the machine.**

In the centre of the picture below the Electrical Unit Left is shown:

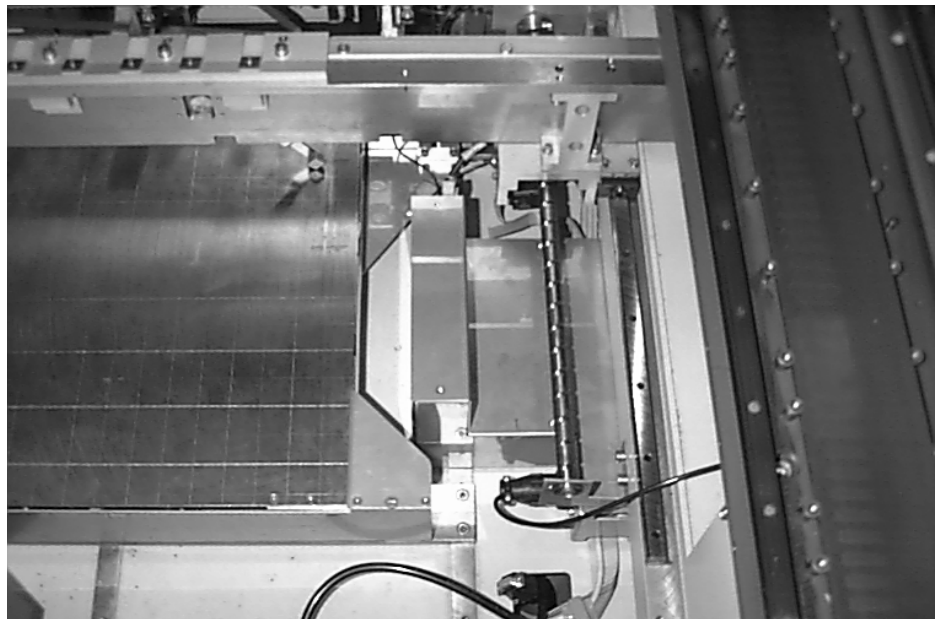


FIGURE 2

The first time installation can be divided in 8 parts:

- Preparation
- Installation of the Y guiding strip
- Installation of the transport homing distance rings
- Installation of the valve
- Mounting the mechanical stopper on the hoist plate
- Making the electrical connections
- Reconfigure the software
- Calibration of the stopper position

2.2 Preparation

1. Delete all existing orders
2. Raise the hoist lift into its upper position (user interface: b. Order, 2. Machine setup, Transport, Raise).
3. Adjust the width of the transport to 150 mm
4. Switch off the machine

2.3 Installation of the Y guiding strip

Hoistplate with Electrical Unit Left as seen from the frontside of the ACM:

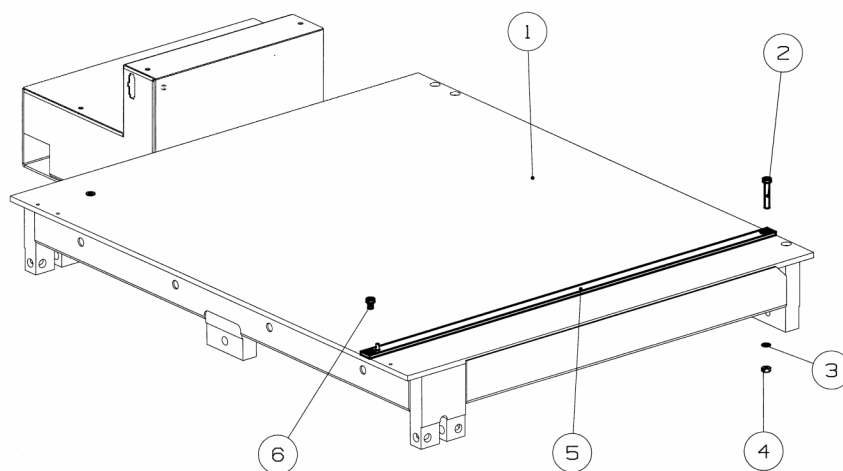


FIGURE 3

The strip (5) has to be mounted on the hoistplate (1) of the PCB transport with two bolts (2 and 6). The existing holes (second hole from the right as seen from the front side of the machine) in the hoist plate shall be used.

1. Dismount the existing bolt (6) on the front side of the hoist plate.
2. Place the strip on the hoist plate with the small pin close to the front side of the machine.
3. Use the smallest delivered bolt (6) to fasten the strip to the hoist plate front side.
4. Remove the side cover of the hoist plate on the rear side of the machine (two bolts, on both the right and left side it is the middle of the three bolts that are visible).
5. Dismount the existing bolt (2) that is bolted from below into the hoist plate.
6. Use the longest delivered bolt (2) to fasten the strip to the hoist plate rear side. Bolt from top completely through the hoist plate and the existing support bracket. To fasten the support bracket to the hoist plate use the delivered washer (3) and nut (4).

2.4 Transport setting

To change standard transport setting for using mechanical stoppers (optional) or to change the transport direction from left to right or vice versa go to:

d:\user\apc\config\machine\machine.cfg (process controller)

[TRANSPORT]

STOPPER = OPTICAL or MECHANICAL

DIRECTION = LEFT_RIGHT or RIGHT_LEFT

In this file the configuration for the stopper type and transport direction can be changed.

2.5 Installation of the transport homing rings

To prevent clamping of the mechanical stopper during the homing of the transport two rings have to be mounted. They have to be placed around the spindles that control the width adjustment. Mount them as close as possible to the fixed front beam of the transport (see drawing).

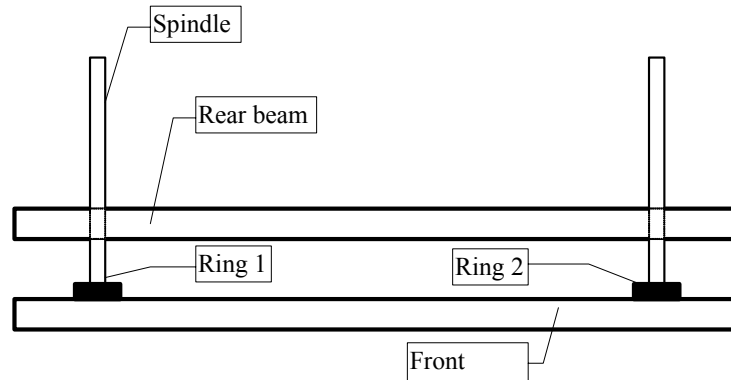


FIGURE 4

2.6 Valve installation

Topview of the Electrical Unit Left:

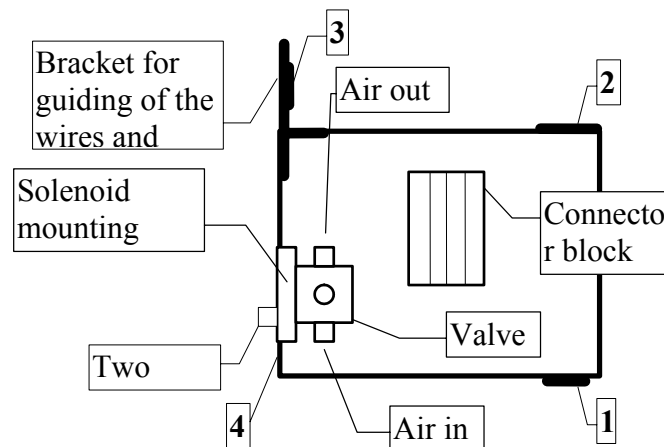


FIGURE 5

1. Remove the cover of the Electrical Unit Left (4 bolts)
2. Loosen (don't remove) the two nuts from the bolts in the lower left corner (4) of the unit that holds the side covers of this unit.
3. Mount the solenoid mounting plate inside the Electrical unit using the two loosened bolts.
4. Fasten the two bolts.
5. Mount the valve with two bolts to the solenoid mounting plate (electric connection of valve upwards).
6. Feed the Air in (black hose) through opening (1) and connect one end to the valve and the other end to the spare air hose that is available in the machine (coming out of the corner of the machine frame).
7. Feed the airhoses and electrical cables of the stopper through opening (3). This is the large hole of the cable and hose bracket (see figure).

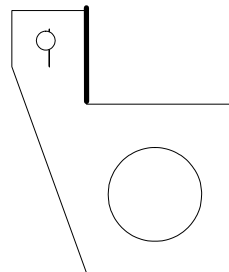


FIGURE 6

Cable guide bracket

8. Feed the airhoses and electrical cables of the stopper through opening (2) of the Electric Unit Left and connect the air hoses to the valve (black to the upper nipple, blue to the lower nipple).
9. Route the wires for the electrical connection according paragraph 3.7
10. Mount the cable guide bracket to the upper left corner of the Electrical Unit Left (see drawing 5.5). Use the small hole to bolt the bracket to the Unit.
11. Close the cover of the Electrical Unit Left.

2.7 Mounting the mechanical stopper on the hoist plate

1. Check that the hoist lift is raised into its upper position.
2. Position the stopper with its magnetic foot over the Y guiding strip.
3. Place the two other support feet on the hoist plate in such a way that the tubes and cables are exactly parallel with the transport beam
4. Since the first action of the transport system will be homing the Y position has to be as close as possible to the front transport beam but free from this transport beam (mount the stopper against the pin on the guiding strip).



CAUTION: Never position the stopper or magnetig support feet with the hoist in the lower position. If a support is positioned under the rear or front beam, damage can occur to the machine

In the picture below the machine is shown equipped with an mechanical stopper:

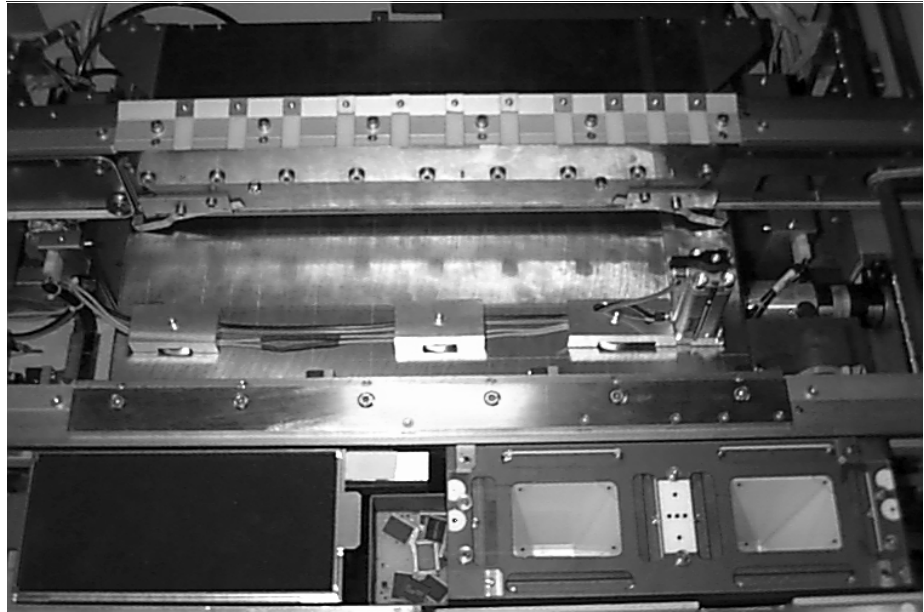


FIGURE 7

2.8 Electrical connection

All electrical connections have to be made to the Input/Output connector block in the Electrical Unit Left.



CAUTION: Making the wrong electrical connection will damage your transport controller card.

2.8.1 Sensor stopper up

Connection has to be made according the labels to the "+" rail, to the "-" rail and to pin 1 of X3 Input/Output connector block left.

2.8.2 Sensor stopper down

Connection has to be made according the labels to the "+" rail, to the "-" rail and to pin 2 of X3 Input/Output connector block left.

2.8.3 Solenoid valve

Connection has to be made according the labels to the "-" rail and to pin 13 of X3 Input/Output connector block left.

2.9 Reconfigure the software

The reconfiguration starts from a running machine.

1. Select M&S engineer
2. Load CD containing the current ACM software (e.g. 3.0) in the CD-ROM player.
3. Open a shell
4. Enter after prompt: d:\install\trp_stop
5. Enter: 2 (mechanical stopper)
6. Enter 0 (exit)
7. Remove the CD from the CD-ROM player
8. Shutdown the ACM
9. Switch machine off, wait 15 seconds, switch machine on
10. Reboot the ACM
11. At this stage the system is configured to support the optical stopper.

2.10 Calibration of the stopper position

Before the machine can be used for production the exact stopper position has to be calibrated. This can be done via the user interface:

- a. User, 6. M&S Functions, 1. Calibrations, Low Level Transport, Board stop position.

CHAPTER 3 Changing the stopper mode

3.1 From mechanical stopper to optical stopper

1. Delete all existing orders
2. Raise the hoistplate of the PCB transport
3. Select M&S engineer
4. Load CD containing the current ACM software (e.g. 3.0) in the CD-ROM player.
5. Open a shell
6. Enter after prompt: d:\install\trp_stop
7. Enter: 1 (optical stopper)
8. Enter 0 (exit)
9. Remove the CD from the CD-ROM player
10. Shutdown and switch of the power
11. Disconnect the Sensors from the Input / Output Connector Block Left (X3-1 and X3-2)
12. Disconnect the 2 Air out hoses from the solenoid valve
13. Remove the stopper with the 2 support feet, cables and hoses from the machine
14. Remove the 2 transport homing rings from the spindles of the transport width adjustment
15. Switch on the machine
16. Carry out a Low Level Transport Calibration of the Board stop position

3.2 From optical stopper to mechanical stopper

1. Delete all existing orders
2. Raise the hoistplate of the PCB transport
3. Select M&S engineer
4. Load CD containing the current ACM software (e.g. 3.0) in the CD-ROM player.
5. Open a shell
6. Enter after prompt: d:\install\trp_stop
7. Enter: 2 (mechanical stopper)
8. Enter 0 (exit)
9. Remove the CD from the CD-ROM player
10. Shutdown and switch of the power
11. Install the stopper with the 2 support feet, cables and hoses into the machine (the stopper cylinder over the Y guiding strip) and guide the cables through the cables and hoses guiding bracket
12. Connect the Sensors to the Input / Output Connector Block Left (X3-1 and X3-2)
13. Connect the 2 Air out hoses to the solenoid valve
14. Install the 2 transport homing rings around the spindles of the transport width adjustment
15. Switch on the machine
16. Carry out a Low Level Transport Calibration of the Board stop position

CHAPTER 4 Troubleshooting

4.1 General

In case the servo power is switched of, the stopper will always automatically go to the down position.

Once the mechanical stopper is installed, the warning message before homing of the transport which says to remove the support pins is extended with the text to move the mechanical stopper to a safe position. This text will not change after switching back to the optical stopper.

4.2 Error messages

Reconfiguring the software for mechanical stopper adds two error messages to the list of error messages:

Mechanical stopper comes up to slow

Mechanical stopper goes down to slow

The explaining help text provides information about possible causes and actions.

4.3 Diagnostics software

The M&S diagnostics software (program.tip, refer to Chapter 10 of the ACM service manual) includes mechanical stopper test functions.

This functionality can be found in test B (TEST TRANSPORT SENSORS + SMEMA) of module TRANSPORT

In this test a menu item F (TEST MECHANICAL STOPPER) is added.

Selecting this item brings the functionality to raise and lower the stopper. A graphical display shows the status of the stopper. An explanation of the possible states of the sensors is given in the screen.

There is also a link between the states of the sensor according the test program and the status of the LEDs on the sensors itself:

SENSOR	Status LED	Status test program
On	Full brightness	Red
Off	Half brightness	Green

TABLE 2

4.4 Spare parts

The complete unit is defined as spare part:

5322 310 11428Mechanical PCB stopper ACM

Other parts are available on special request. For reference see next paragraph.

4.5 Overview drawing

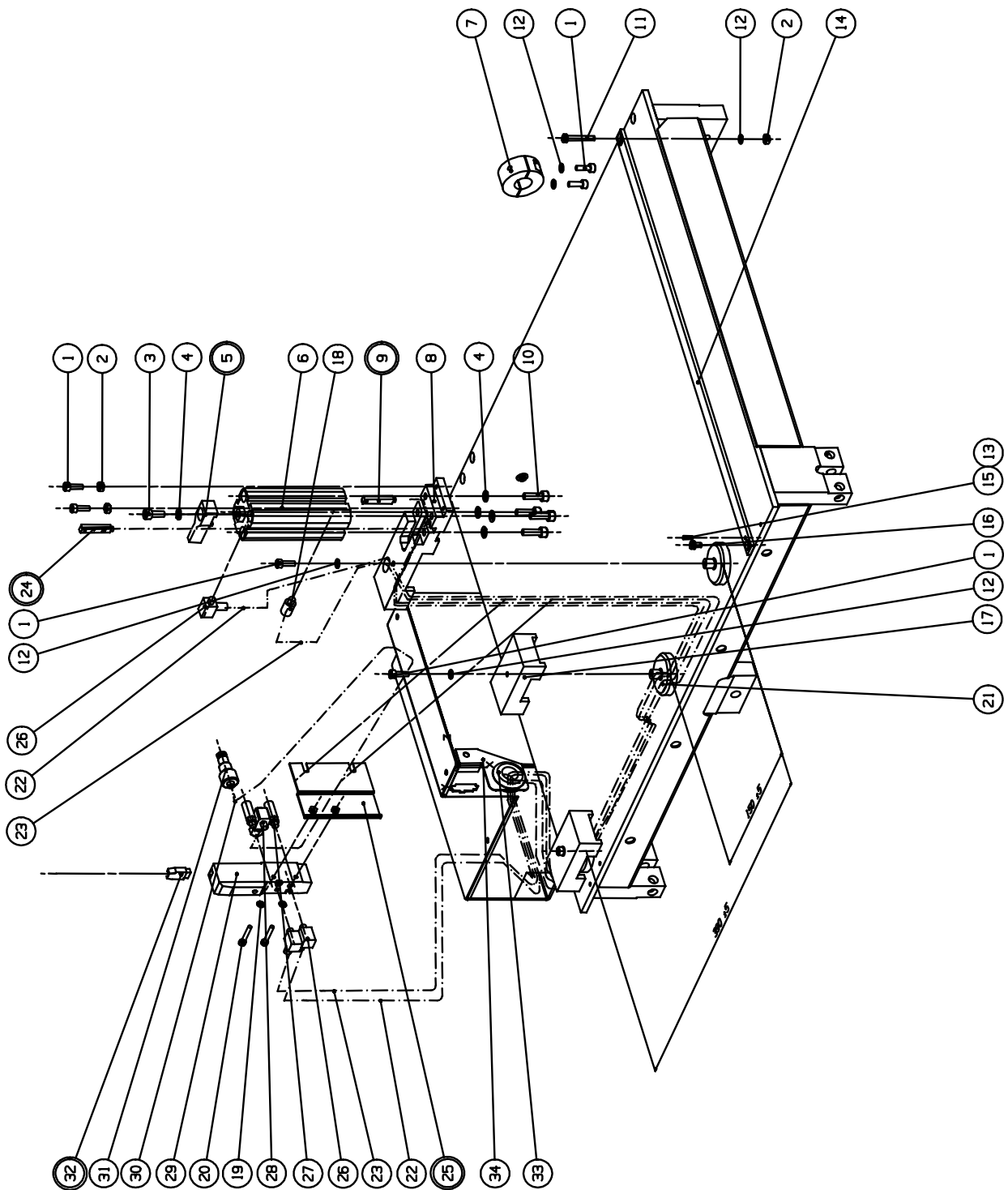


FIGURE 8



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